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Disclaimer

Abstract

The focus of this project is to demonstrate the effectiveness of Amended Silicates™ sorbents as a mercury control technology for coal-fired power plants. The demonstration will be conducted at Cinergy's Miami Fort Unit 6 for a period of six weeks under typical plant operating conditions. Several trial campaigns will be completed: a parametric series of injection rates for the Amended Silicates sorbent to characterize its performance at the host site, a parametric series of injection rates for powdered activated carbon to use as a basis of comparison, and an extended period (30 days) over which Amended Silicates sorbent is injected to evaluate long-term performance of the technology in an operating power plant, including impact on balance of plant equipment. Samples of the host unit fly ash mixed with Amended Silicates sorbent will be extracted for testing as a cement replacement. A unique feature of the Amended Silicates sorbent is that its addition to a flue gas stream does not affect the salability of the collected fly ash plus sorbent as a pozzolan additive.

In this second quarter of the project, activities focused on preparations for the field demonstration, including further computational fluid dynamics modeling of the injection system, preparation of subcontracts for project team members, planning for the demonstration, and preparation of the QA/QC plan for the project. The project team will be able to leverage experience gained in a short-term trial of the Amended Silicates sorbent at an operating power plant in Colorado to confirm design parameters and operating protocols for numerous project activities.

TABLE OF CONTENTS

TABLE OF FIGURES

Executive Summary

The Amended Silicates™ sorbent technology is a mercury control material that is a direct replacement for activated carbon. Amended Silicates sorbent is a powdered material similar to carbon injected upstream of existing particulate control equipment for rapid and effective capture of vapor-phase mercury in the flue gas stream. This technology has been under development for the past two years with funding from the EPA and DOE, and has achieved success in demonstrating the sorbent at a pilot scale on a slipstream from a Colorado power plant. This demonstration of Amended Silicates™ sorbents will evaluate the use of injected particulate sorbents to control of mercury emissions from Cinergy's Miami Fort Unit 6 for a period of six weeks under various conditions. A consortium has been established to support the technical and financial requirements imposed by a long-term test of this technology. The consortium includes utilities with an interest in cost-effective mercury control technologies, mercury control technology suppliers (i.e., Amended Silicates, LLC and its parent companies); the University of North Dakota Energy and Environmental Research Center to lead the mercury measurement effort; a modeler to provide insight into the fluid mechanics of sorbent injection; with strong interest on the part of EPRI and the American Public Power Association.

The project has been defined in three stages: **preparation**, which incorporates all activities to prepare the host site for the demonstration, as well as the manufacture of 50-100 tons of Amended Silicate™ sorbent; **demonstration**, where a matrix of sorbent injection cases will be conducted; and **analysis**, during which all the collected data will be correlated, analyzed, and interpreted to provide quantitative information regarding the performance of the Amended Silicate™ sorbent at a commercial scale. ADA has established a series of milestones for these three stages as delineated in this report.

For this period, work consisted of tasks in the Preparation phase and Analysis phase. Activities focused on planning and on the analysis of the layout for the sorbent injection system via a computational fluid dynamics (CFD) modeling approach to the problem. Amended Silicates, LLC contracted with CH2M HILL to model the arrangement of sorbent injection ports on the host unit at Miami Fort station. An experiment was conducted to evaluate candidate configurations of the injection lance assembly to provide a uniform injection of sorbent particles in the host unit flue gas stream.

Amended Silicates also finalized a subcontract with the Western Kentucky University Research Foundation for their participation in the project to provide Ontario-Hydro wet chemistry sampling of mercury concentration in the flue gas during injection of Amended Silicates sorbent as well as powdered activated carbon. Further, the University of North Dakota Energy and Environmental Research Center (UNDEERC) prepared a draft QA/QC plan for the project.

Amended Silicates, LLC also recently completed an independently funded short-term trial of the injection of Amended Silicates sorbent at an operating power plant in Colorado. Amended Silicates, LLC intends to leverage the preparations for this trial as well as capitalize on results in the upcoming project activities associated with the Miami Fort 6 demonstration.

Introduction

Amended Silicates, LLC, has been awarded a project to demonstrate its Amended Silicates™ mercury removal sorbent technology in a full-scale trial at a coal fired power plant. The trial is to be hosted by Cinergy at a site in Ohio and funded in part by US Department of Energy's National Energy Technology Lab (NETL).

The Amended Silicate™ sorbent technology, a direct replacement for activated carbon, is a powdered sorbent injected upstream of existing particulate control equipment for rapid and effective capture of vapor-phase mercury in the flue gas stream. This technology has been under development for the past two years with funding from the EPA and DOE, and has achieved success in demonstrating the sorbent at a pilot scale on a slipstream from a Colorado power plant.

The Amended Silicate™ sorbents use silicate materials as substrate particles on which a chemical reagent with a strong affinity for mercury and mercury compounds is impregnated. Because of their physical construction, these silicates present extended surface area on each particle combined with an easily-generated particle size of a few microns. This configuration promotes maximum exposure of the chemical amendment to the mercury vapor present in the coal-fired flue gas stream. The base silicate materials typically sell for *4-8¢ per pound*, so they represent a very cost-effective sorbent material. In addition, because of their silicate content, they have been shown to allow the continued sale of fly ash as a pozzolan material. Tests completed by Boral Materials Technologies have indicated that there is no effect on fly ash use in concrete due to the addition of Amended Silicate™ sorbents, in dramatic contrast to the effect of powdered activated carbon injection.

To support EPA's announced intent to regulate the emissions of mercury from coal-fired power plants, NETL solicited proposals and recently has selected eight of those proposals for cost-shared projects to demonstrate mercury control concepts at a commercial scale. The objective of the program is to gather data to document the performance of mercury control technology alternatives when installed and operated at full-scale (100-MW) generating units. One of the selected proposals is for the demonstration of Amended Silicates™ sorbent technology.

This demonstration of Amended Silicate™ sorbents will evaluate the control of mercury emissions from Cinergy's Miami Fort Unit 6 for a period of six weeks under various conditions. A consortium is being established to support the technical and financial requirements imposed by a long-term test of this technology. The consortium will include utilities with an interest in cost-effective mercury control technologies, especially those that permit continued sale of fly ash as a pozzolan material; mercury control technology suppliers (i.e., Amended Silicates, LLC and its parent companies); an organization to lead the mercury measurement effort; a modeler to provide insight into the fluid mechanics of sorbent injection; and other interested parties. There is strong interest on the part of EPRI and the American Public Power Association in participating in the planned demonstration project.

Amended Silicates, LLC, is a joint venture company formed by ADA Technologies and CH2M HILL that is focused on the manufacture and sale of Amended Silicate™ sorbent. The Amended Silicates team will lead the technical effort of the proposed project. Cinergy has offered its Miami Fort Unit 6 as a host site, and will provide on-site technical support during injection of the sorbent material. The mercury semi-continuous emissions monitors (SCEMS) will be provided by the University of North Dakota's Energy and Environmental Research Center (UNDEERC), and the Ontario-Hydro wet chemistry testing will be conducted by the University of Western Kentucky. Boral Materials Technologies will perform tests of the collected sorbent plus fly ash to assess the impact of the added sorbent on the use of fly ash as a concrete additive. The ability to continue to sell fly ash is believed to be one of the significant advantages of Amended Silicate™ sorbents in comparison to activated carbon.

Project Description

This trial demonstration project is intended to show the effectiveness of Amended Silicate™ sorbent as a mercury control technology, including the ability to maintain fly ash sales from plants implementing its use. The project will incorporate three sorbent injection campaigns: one where powdered activated carbon is injected for a base-comparison case, a second where Amended Silicates sorbent is injected to establish process parameters required to meet mercury control targets, and a third where Amended Silicate sorbent is injected for a contiguous period of 30 days to validate long-term consistent performance and to discover any impact on balance of plant operation.

There are two major objectives for the full-scale demonstration project. The first is to produce uniform and high-quality Amended Silicate™ sorbent in multi-ton quantities for use in the proposed testing. The second is to demonstrate the ability of Amended Silicate™ sorbent to control emissions of mercury from commercial coal-fired power plants over a typical range of operating conditions for an extended period of time. The data analyses will be extensive, and will include computation of mercury removal rates and the efficiency of Amended Silicate™ sorbents in these applications.

The project has been defined in three stages: **preparation**, which incorporates all activities to prepare the host site for the demonstration, as well as the manufacture of 50-100 tons of Amended Silicate™ sorbent; **demonstration**, where a matrix of sorbent injection cases will be conducted; and **analysis**, during which all the collected data will be correlated, analyzed, and interpreted to provide quantitative information regarding the performance of the Amended Silicate™ sorbent at a commercial scale.

There are specific activities to be carried out in each stage of the project, as described below.

Preparation

- Project planning, including placement of subcontracts with team members and negotiation of a host site agreement with Cinergy.

- Development of a project schedule that reflects availability of the site, subcontractors, and time needed to prepare a commercial quantity of Amended Silicate sorbent.
- Site preparation, including the selection of locations for flue gas sampling ports and sorbent injection ports, and for the installation of a sorbent injection system to supply sorbent to the injection lances.
- Completion of a computational fluid dynamics modeling study to evaluate options for the number and locations of sorbent injection lances.
- Acquisition of a leased sorbent injection skid, fabrication of injection lances, and installation of the full sorbent injection system.
- Transport and installation of the semi-continuous mercury emissions monitors upstream of sorbent injection and at the outlet to the Unit 6 electrostatic precipitator.
- Preparation of 50 tons of Amended Silicate sorbent for use in the trial. This activity includes selection of a toll processor (contract vendor) to manufacture the sorbent, and oversight by Amended Silicates, LLC to assure quality control and consistency of the final product.

Demonstration

In the demonstration phase a series of campaigns will be completed with different sorbents to characterize their performance in capture of mercury from the flue gas of Miami Fort Unit 6. Mercury CEMs will be operated throughout the demonstration phase to collect data on mercury concentrations upstream of sorbent injection and at the outlet of the ESP of the host unit. At four discrete times in the demonstration, Ontario-Hydro wet chemistry sampling will be performed as a check against the mercury CEMs data. The specific mercury removal measurement campaigns are described below.

- Baseline mercury removal characterization for the host unit over a one to two week period.
- Injection of powdered activated carbon as a mercury sorbent on Miami Fort Unit 6. This campaign will run for one to two weeks, with target mercury removal rates of 55% and 80%.
- Injection of Amended Silicate sorbent in a parametric series of trials, to characterize performance in the host unit under a range of operating conditions. Target mercury removal rates will be 55% and 80% for this nominal two-week trial.
- Return to normal operations (no sorbent injection) for a period of one to two weeks to re-establish a baseline before initiation of a longer-term trial of Amended Silicates sorbent.
- Extended trial of Amended Silicate sorbent for a period of 30 days to evaluate performance and impact on balance of plant equipment.

- During each campaign, samples of fly ash mixed with mercury sorbent material will be extracted for use in tests to determine the effect of the sorbent on the use of the mixture as a pozzolan replacement in the manufacture of concrete.

Analysis

The use of CEMS results in the acquisition of a substantial quantity of data over the demonstration phase of the project. This information will be subject to a rigorous QA/QC review protocol, then archived to a project website where it will be accessible to project team members. This website will provide the home for a project database to be used to correlate mercury removal results with operating conditions of the host unit and performance of the particulate control equipment. The intent is to exploit the website to facilitate access to the data on a timely basis throughout the project. Specific activities to be carried out in the Analysis phase are noted below.

- Prepare and execute a QA/QC plan for the project.
- Establish a project website as a mechanism to share information and coordinate analysis of posted results.
- Create a project data base as a location to which all pertinent information on trials can be transferred for secure storage and analysis.
- Perform routine QA/QC screening of data and add qualified data to the project data base.
- Review and analyze trial data in the project data base to establish performance measures and trends in the data set.
- Analyze samples of fly ash plus sorbent to document the effect of sorbent addition on the use of fly ash as a cement replacement in concrete.
- Supply samples of fly ash to DOE contractor for leachate and mercury stability testing.
- Preparation of reports as required by the Cooperative Agreement.
- Preparation of technical papers that document the results of the trial demonstration.
- Overall management of the project with respect to scope, schedule, and budget.

Project activities are being carried out by technical personnel from the two parent companies of Amended Silicates, LLC. Jim Butz of ADA Technologies serves as Principal Investigator for the project with strong technical support from CH2M HILL and the other members of the consortium. Tom Broderick of ADA will serve as the lead engineer for the project team at the host site during the trial. Joe Hammond of CH2M HILL will direct the site engineering activity for the installation of the sorbent injection system and mercury CEMs.

Project Milestones

ADA has established a series of milestones for this project, as delineated below.

- **April, 2004:** Cooperative agreement signed by Amended Silicates, LLC and project initiated.
- **August, 2004:** Subcontracts in place, project team coordinates schedule.
- **December, 2004:** Toll manufacturer selected for manufacture of Amended Silicate sorbent material to be used in trial.
- **January 2005:** Start installation of sorbent injection system and mercury CEMs at the host site.
- **March 2005:** Deliver sorbents to site (powdered activated carbon and Amended Silicate sorbent).
- **March 2005:** Begin injection trial.
- **June 2005:** Submit samples of fly ash plus sorbent for analysis of suitability for use in concrete.
- **July 2005:** Samples provided for leachate and stability testing.
- **August 2005:** Data analyses completed.
- **Second half of 2005 and 2006:** Presentation of results at technical conferences.

Project Management Activities to Date

This report documents Amended Silicates project activities from July1 through September 30, 2004. For this period, work consisted of tasks in the Preparation phase and Analysis phase. Activities focused on planning, on the continued analysis of the layout for the sorbent injection system via a computational fluid dynamics modeling approach to the problem, and on the preparation of a QA/QC plan for the project.

A presentation that described the status of the Amended Silicates demonstration project at Miami Fort 6 was prepared and presented at the annual DOE contractors conference in Pittburgh in July. Mr. Jim Butz, the project principal investigator, made the presentation, and also served on a discussion panel for the meeting.

As part of our effort to complete the project team, a statement of work was prepared for the Western Kentucky University Research Foundation (WKURF), the organization that will provide Ontario-Hydro sampling support for the measurement of gas-phase mercury in the flue gas at the host site. The team from WKU will operate under the supervision of Dr. Wei-Ping Pan. A total of six test periods have been identified during which Ontario-Hydro sampling will be performed. The WKU sampling effort will be coordinated with operation of the mercury continuous emissions monitors by the University of North Dakota's Energy and Environmental Research Center and directed by the project Site Engineer, Mr. Tom Broderick of ADA

Technologies. The WKURF subcontract was finalized in this reporting period and subsequently forwarded to WKU for signature.

Additional discussions were held with the host site regarding planning for 2005 site activities. The project team agreed to schedule a meeting at the Miami Fort generating station some time in the fourth quarter of 2004 to perform a walk-through of the site for all participating parties, including WKU and UNDEERC, who will be making the mercury measurements during the demonstration on Unit 6.

Amended Silicates, LLC initiated discussions in this quarter with an international chemical and catalyst manufacturing firm regarding the manufacture of the 50 tons of Amended Silicates sorbent needed for the demonstration. This organization would be a strategic partner, whose expertise in large-scale manufacturing could be valuable in the process scale-up to the production of the demonstration batch of Amended Silicates sorbent. A nondisclosure agreement was negotiated and technical discussions were undertaken, with an agreement for further discussions as technical questions are answered by the Amended Silicates engineering staff. This activity supports the project plan to select a sorbent manufacturing partner by the close of 2004.

A draft of the quality assurance and quality control plan was prepared by the Energy and Environmental Research Center of the University of North Dakota and delivered to Amended Silicates in September. The document discusses the following topics:

- Introduction
- Quality Objectives and Criteria
- Mercury Sampling QA/QC Requirements
  - Ontario Hydro Mercury Speciation Method
  - Continuous Mercury Monitors
- Analytical QA/QC Requirements
- Sample Handling and Custody Requirements
- Data Management, Documentation, and Records
- Assessments and Response Actions

In the next quarter, Amended Silicates will review and critique the draft plan, which will then be revised by UNDEERC to incorporate comments. The final QA/QC document will be adopted for use in the project to assure that the data obtained are useful in the analysis of the performance of the Amended Silicates sorbent in the planned demonstration.

In May of 2004 Amended Silicates, LLC completed a short-term demonstration of the use of one of its mercury sorbent formulations in a coal-fired power plant in Colorado. The host site, Xcel Energy's Arapahoe station unit 3, burns Powder River Basin subbituminous coal, and is equipped with a reverse-gas baghouse for particulate control, and also features a dry sorbent injection system for reduction of SO_2 emissions. We were able to use the previously installed injection system for the addition of Amended Silicates sorbent for mercury control. A second

series of trial injections were made to gather data on the performance of powdered activated carbon in the host unit for comparison purposes. Samples of fly ash plus sorbent were extracted from the baghouse and sent to Boral Materials Technologies, Inc. for evaluation of their use as a cement replacement in the preparation of concrete. The analysis of the results of that short-term test were completed in September, and a final report was prepared and submitted to Xcel Energy and EPRI, who provided cofunding for the project.

A presentation on the demonstration trial was made at September's Subbituminous Energy Council meeting in Denver. Conclusions from the project noted that:

- ***Amended Silicates was shown to be an effective mercury control sorbent, but less efficient than activated carbon in this trial.*** The Amended Silicates sorbent employed in this trial was the first-generation material, with this particular batch representing the initial effort to scale production to commercial quantities. Some issues were encountered in this scale-up process. There were lessons learned here that will be useful in the manufacture of 50 tons of Amended Silicates sorbent for the Miami Fort 6 demonstration.

- ***Amended Silicates sorbent was successfully used in the existing sorbent injection system without modification.*** We were able to demonstrate that Amended Silicates sorbent could be delivered by a conventional dry sorbent injection system using the same equipment as for the powdered activated carbon. This offers strong evidence that the plan to use a modular injection system supplied by Norit for the Miami Fort 6 demonstration will be successful.

- ***Neither mercury sorbent had detectable impact on baghouse operation.*** While Miami Fort unit 6 is equipped with an ESP for particulate control, the fact that there was no discernable impact on balance of plant equipment with the injection of Amended Silicates sorbent bodes well for a similar result at the DOE demonstration site.

- ***Amended Silicates sorbent was shown in laboratory tests to have no effect on mortar air ratio, allowing continued sale of fly ash as cement replacement.*** This is another confirmation that one key feature of the Amended Silicates sorbent is its lack of effect on the salability of fly ash. This is an important differentiator from activated carbon, the use of which for mercury control has been shown to require landfilling of mixtures of fly ash plus powdered activated carbon sorbent.

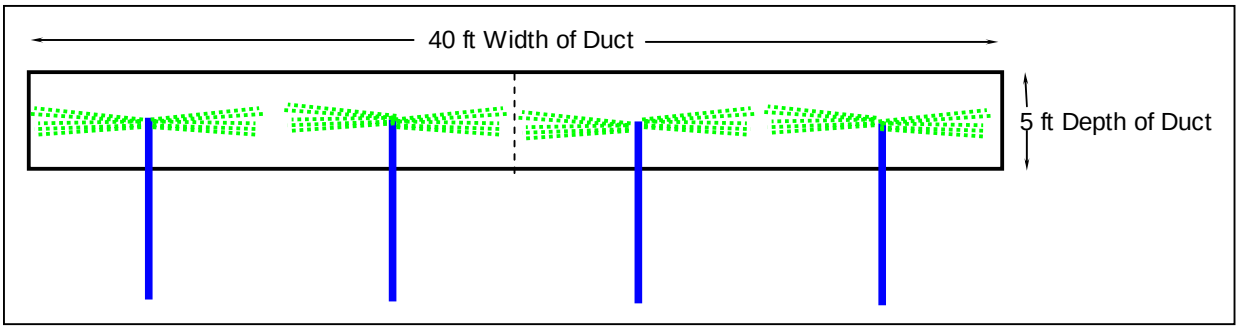
In addition, the Arapahoe trial will provide valuable experience in preparation for the Miami Fort 6 demonstration. ADA Technologies and CH2M HILL prepared a comprehensive test plan for the Arapahoe trial that will become a template for a similar document needed for the Miami Fort 6 demonstration. The Arapahoe trial also offered the opportunity to develop and refine a sampling protocol to obtain samples of mixed fly ash plus sorbent from the hoppers of the Unit 3 baghouse. We will need to obtain similar samples from the ESP hoppers at Miami Fort 6 for use in additional evaluations of the properties of the sampled material in the preparation of concrete. Further, the mercury measurement technique employed at Arapahoe featured the use of mercury continuous emissions monitors supplied and operated by Apogee Scientific. The Arapahoe trial allowed us to observe the response of the CEMMs systems to the injection of Amended Silicates sorbent. We discovered that the Amended Silicates sorbents require a longer

period of time to reach an equilibrium after initiation of injection- at least several hours, as compared to about 30 minutes to one hour for powdered activated carbon in the same generating unit. This information will prove valuable in preparing the detailed test plan to be followed in the demonstration at Miami Fort 6.

Experimental

Amended Silicates, LLC contracted with CH2M HILL to commence computational fluid dynamics (CFD) modeling efforts to investigate the arrangement of the sorbent injection ports on the host unit at Miami Fort station. This work was begun in the previous quarter, and continued to completion in this reporting period. As previously reported, the modeling was initiated with a four injection lance configuration. Results from this arrangement were presented in the previous quarterly report, and showed considerable gaps in the dispersion of sorbent in the flue gas stream. This baseline array of injection lances is shown as a schematic in Figure 1 below. It is important to note that the four injection lances are designed with opposing ports, which use carrier air to introduce sorbent particles into the flue gas orthogonal to the direction of its flow (out of the page in the Figure 1 layout). In this configuration, the injection lances are about ten feet apart, so to achieve rapid dispersion of the sorbent particles, the jets from the lance ports must penetrate about five feet into the flue gas (the green lines from the tips of the blue injection lances in Figure 1). The only motive force to drive the sorbent injection is that of the carrier air that transports the particles to the lances. In this quarter, a second configuration was modeled where the number of lances was doubled to eight and the associated spacing was halved to five feet.

Figure 1. Layout for Sorbent Injection Lances for Miami Fort Unit 6 Ductwork

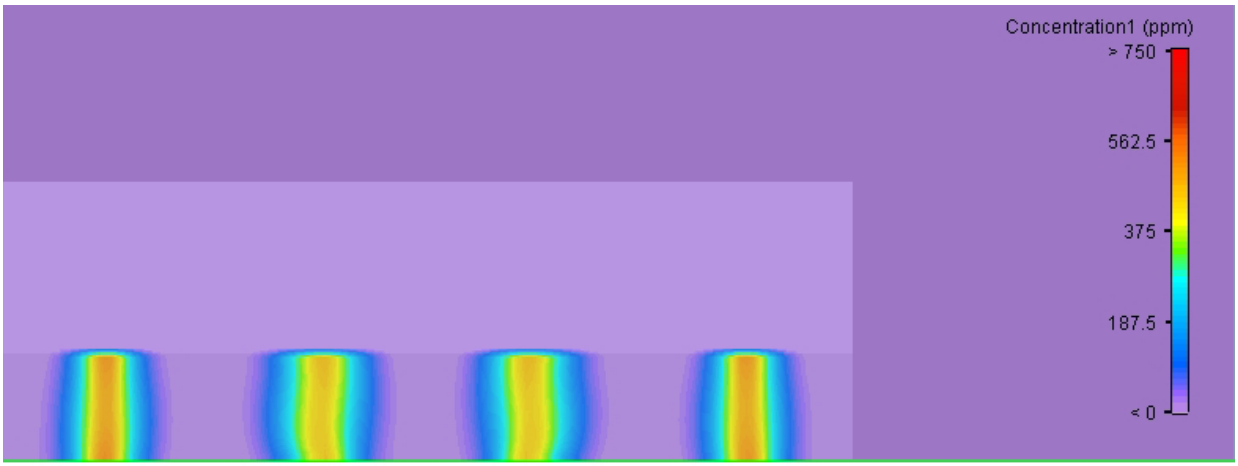


Results and Discussion

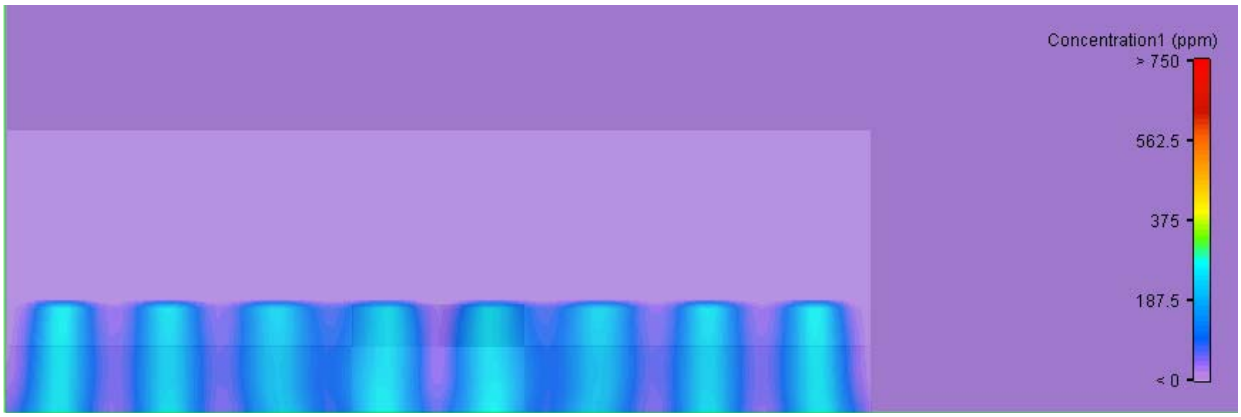
Additional runs of the sorbent distribution CFD model that employed an eight injection lance configuration were made in July. Results of this additional modeling are compared to the earlier 4-lance configuration in Figure 2. below. These present visualizations of sorbent particle concentrations and gradients at the 40-foot elevation above the injection level. The duct cross-section (a rectangle of dimensions 5 ft. by 40 ft.) is shown in different shades of purple close to the vertical and horizontal centers of the diagram. The two panels in the figure show the calculated distribution of sorbent particles in the duct cross-section for the two lance configurations. Panel (a) presented the four-lance calculations previously shown in the last

quarterly technical report. The multicolor gradients show that there is significant inhomogeniety in the four-lance configuration. In contrast, panel (b) shows only shade gradients, indicating a much more uniform distribution of sorbent in the duct cross section when eight injection lances are deployed. Based on these results, we intend to use an eight-lance configuration for the injection of Amended Silicates sorbent at Miami Fort 6.

Figure 2. Sorbent Particle Dispersion Gradients from CFD Model- 40 ft above Injection Location.



(a) Four-lance Configuration



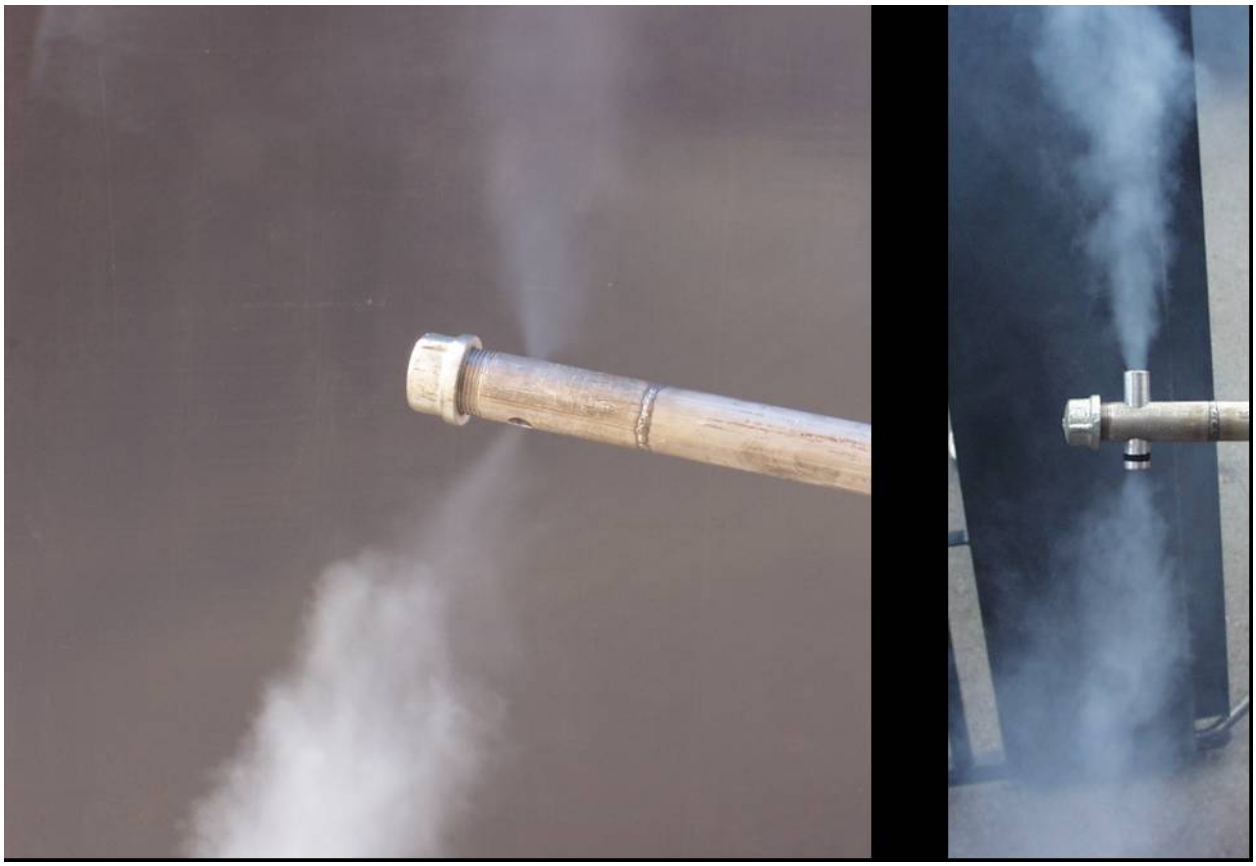
(b) Eight-lance Configuration

In the previous quarter ADA Technologies built a prototype injection lance in order to evaluate injection nozzle configuration details. The prototype lance was evaluated with and without nozzle extensions. Tests of the prototype injection lance options were performed in this reporting quarter to determine the preferred design option. A simple test was configured where a smoke flare was used to visualize the discharge flow from the opposing injection ports in two lance configurations. The carrier air rate was that specified for the CFD modeling, with a

nominal discharge velocity of about 60 feet per second. Photos of the discharge were taken with a digital camera.

Results of the test are presented in Figure 3 below. It seems obvious from the photos that the addition of short injection nozzle extensions provides more uniform plume dispersion in the direction normal to the lance. Such a configuration will be used in the final design of the injection lances to be installed at Miami Fort 6.

Figure 3. Evaluation of Injection lance port designs



(a) unmodified lance **(b) nozzle extensions**

Conclusions

- The modeling effort to date showed that an eight-lance configuration is preferable to the use of four sorbent injection ports for uniform distribution of the sorbent in the ductwork.
- Flow visualization trials of a prototype injection lance showed the value of adding nozzle extensions to better direct the flow of sorbent into the flue gas stream.

- Analysis of results from a short-term trial of Amended Silicates sorbent at an operating power plant in Colorado show that conventional dry sorbent injection equipment can adequately handle Amended Silicates sorbent.
- The test plan developed for the short term trial can serve as a template for the preparation of a test plan for the DOE-funded Miami Fort 6 demonstration.
- Valuable experience with scale up of manufacturing was gained in the preparation of a multi-ton batch of Amended Silicates sorbent. The lessons learned will prove significant as we move toward the production of 50 tons of Amended Silicates sorbent for the Miami Fort 6 demonstration.
- Testing of samples obtained from the fly ash hoppers of the Arapahoe Amended Silicates injection trial showed that the addition of Amended Silicates sorbent did not impact the performance of fly ash in mortar air tests that simulate the use of fly ash in the preparation of concrete. This is a strong indication that the Amended Silicates sorbent would not affect the salability of fly as for use as a cement replacement. This reinforces one of the market drivers for the Amended Silicates sorbent.

References

Magno, Gary, and C. Turchi (2004), "Amended Silicates™ for Mercury Control- A Status Report", presented at the fall meeting of the Subbituminous Energy Council, Denver CO, September 15.

Bibliography

None.

List of Acronyms and Abbreviations

CEM	Continuous Emissions Monitor
CFD	Computational Fluid Dynamics
DOE	Department of Energy
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
ESP	Electric Static Precipitator
NETL	National Energy Technology Laboratory
QA/QC	Quality Assurance/Quality Control
SCEM	Semi- Continuous Emissions Monitor
UNDEER	University of North Dakota's Energy and Environmental Research Center
US	United States

Planned Activities for Next Quarter

The next quarter of the project will see continued efforts in the design and planning phases, including the following elements:

- Revision of the draft QA/QC plan by UNDEERC to reflect comments from ADA project management personnel.
- Continued discussions with a strategic partner who is a major manufacturer of sorbent and catalyst materials. These show promise to reach an agreement where the prospective partner offers technical support in improving the sorbent manufacturing process.
- Continued work on a host site agreement, with the intent to execute the agreement in the next quarter. ADA will lead this effort.
- Begin preparation of the test plan and associated sampling protocols. ADA Technologies to lead this effort.
- Prepare reports to meet requirements of the cooperative agreement. ADA Technologies to complete these reports.
- Plan for a coordinated site visit to bring together all participants (Cinergy, ADA, CH2M HILL, UNDEERC, and WKU) at the host site for a walk-through and detailed discussion of locations for installation of sorbent injection equipment and mercury measurement instrumentation. ADA and Cinergy to coordinate planning for this meeting.